Efficacy of carcass electrical stimulation in meat quality enhancement: a review

ABSTRACT

The use of electrical stimulation (ES) as a management tool to improve meat quality and efficiency of meat processing is reviewed. The basis of the efficacy of ES is its ability to fast track postmortem glycolysis, which in turn stimulates myriad histological, physical, biochemical, biophysical and physiological changes in the postmortem muscle. Electrical stimulation hastens the onset and resolution of rigor mortis thereby reducing processing time and labor and plays a vital role in improving meat tenderness and other meat quality traits. However, ES may have negative impacts on some meat quality traits such as color stability and water holding capacity in some animals. Electrical stimulation is not an end in itself. In order to achieve the desired benefits from its application, the technique must be properly used in conjunction with various intricate antemortem, perimortem and postmortem management practices. Despite extensive research on ES, the fundamental mechanisms and the appropriate commercial applications remained obscured. In addition, muscles differ in their response to ES. Thus, elementary knowledge of the various alterations with respect to muscle type is needed in order to optimize the effectiveness of ES in the improvement of meat quality.

Keyword: Electrical stimulation; Meat quality; Tenderness; Postmortem glycolysis